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10/591,010	08/29/2006	Kyungmin Na	SLN-0006	5816

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EXAMINER	
ELBIN, JESSE A	
ART UNIT	**PAPER NUMBER**
2615	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,010	NA, KYUNGMIN	
	Examiner	Art Unit	
	JESSE A. ELBIN	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *29 August 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Figure 7 #170.

2. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: Figure 7, reference character #170 is not described in the specification. See drawing objection above.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-2, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manabe (US Patent 6,678,381 ('381) (already of record)).

Regarding claim 1, Manabe teaches a mobile communication terminal board comprising: a baseband chip (audio generator; '381 Fig. 1 #10) for processing audio data ("The audio generator 10 generates the electric audio signal corresponding to sound audible to a listener"; '381 col. 3 lines 59-60); an ultrasonic drive chip (frequency modulator; '381 Fig. 1 #20) for receiving and modulating a signal output from the baseband chip to an ultrasonic band signal ("frequency modulator 20…frequency modulates the ultrasonic signal with the audio signal to produce the frequency modulated ultrasonic signal; '381 col. 3 lines 2-4); and an ultrasonic speaker (electro-acoustic transducer; '381 Fig. 1 #40) for outputting the ultrasonic signal output from the ultrasonic drive chip to an outside ("the electro-acoustic transducer 40…transduces the frequency modulated ultrasonic signal into acoustic waves"; '381 col. 3 lines 4-7).

Regarding claim 2, Manabe remains as applied above.

Manabe teaches the ultrasonic drive chip and the ultrasonic speaker being implemented and installed as an integrated module ('381 Fig. 1 *wherein Manabe does not explicitly describe the system as being an "integrated module", Manabe does teach the system components working together; hence are integrated into a module*).

Regarding claim 8, Manabe teaches a mobile communication terminal board comprising: an ultrasonic speaker (electro-acoustic transducer; '381 Fig. 1 #40) for outputting a signal modulated to an ultrasonic band ("the electro-acoustic transducer 40…transduces the frequency modulated ultrasonic signal into acoustic waves"; '381 col. 3 lines 4-7); and a baseband chip (audio generator; '381 Fig. 1 #10), integratedly provided with an ultrasonic drive chip (frequency modulator; '381 Fig. 1 #20 *wherein Fig. 1 illustrates the audio generator 10 being integrated with the frequency modulator 20*) for driving the ultrasonic speaker ("frequency modulator 20…frequency modulates the ultrasonic signal with the audio signal to produce the frequency modulated ultrasonic signal; '381 col. 3 lines 2-4), for processing audio data ("The audio generator 10 generates the electric audio signal corresponding to sound audible to a listener"; '381 col. 3 lines 59-60); an ultrasonic drive chip (frequency modulator; '381 Fig. 1 #20).

6. Claims 3-4 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manabe (US Patent 6,678,381 ('381) (already of record)) as applied to claim 1 and 8 above, and further in view of Pompei (US Patent 6,775,388 ('388)).

Regarding claim 3, Manabe remains as applied above.

Manabe does not explicitly teach the ultrasonic speaker being implemented by a plurality of thin film type ultrasonic transducers.

In the same field of endeavor, Pompei teaches an ultrasonic speaker (transducer; '388 title) being implemented by a plurality of thin film type ultrasonic transducers ("[an electrostatic transducer] module 29 comprises a plurality of electrostatic transducers, corresponding with respective apertures 36"; '388 col. 4 lines 11-12 and Fig. 1A) for the benefit of broadening the overall response of the module ('388 col. 4 lines 39-45).

It would have been obvious to one of ordinary skill in the art at the time of the invention to separate the ultrasonic transducer as taught by Manabe into a plurality of electrostatic transducers as taught by Pompei for the benefit of broadening the overall response of the module.

Regarding claim 4, Manabe remains as applied above.

Manabe does not explicitly teach the ultrasonic speaker being an ultrasonic transducer using a PVDF (polyvinylidene difluoride) film type piezoelectric element.

In the same field of endeavor, Pompei teaches an ultrasonic speaker (transducer; '388 title) being an ultrasonic transducer using a PVDF (polyvinylidene difluoride) film type piezoelectric element ("utilizing light, flexible membrane materials such as polyvinylidene fluoride (PVDF) film"; '388 col. 2 lines 22-23) for the benefit of creating efficient ultrasonic transmission ('388 col. 2 lines 25-27).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a PVDF film as a membrane in an electrostatic ultrasonic transducer as taught by Pompei in the ultrasonic speaker system taught by Manabe, as PVDF films are light and flexible, resulting in efficient ultrasonic transmission.

Regarding claim 9, Manabe remains as applied above.

See rejection of claim 3 above.

Regarding claim 10, Manabe remains as applied above.

See rejection of claim 4 above.

7. Claims 5-6 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manabe (US Patent 6,678,381 ('381) (already of record)) as applied to claims 1 and 8 above, and further in view of Han et al. (WO 01/22776 ('776)).

Regarding claim 5, Manabe remains as applied above.

Manabe does not explicitly teach the ultrasonic speaker being implemented through an MEMS (Micro Electro Mechanical System) technique.

In the same field of endeavor, Han teaches an ultrasonic speaker being implemented through an MEMS (Micro Electro Mechanical System) technique ("a parylene piezoelectric dome shaped diaphragm…generates ultrasonic sound effectively"; '776 page 5 lines 4-8 and "Microelectromechanical Systems (MEMS)

technology has been used to fabricate…microspeakers on a silicon wafer"; '776 page 4 lines 9-10) for the benefit of integrating the sensor and amplifier on a single chip, as well as reducing cost and size ('776 page 4 lines 12-13).

It would have been obvious to one of ordinary skill in the art at the time of the invention to create the ultrasonic speaker system as taught by Manabe via MEMS technology as taught by Han for the benefit of integrating the sensor and amplifier on a single chip, as well as reducing cost and size.

Regarding claim 6, Manabe and Han remain as applied above.

See rejection of claim 5 above, where Han teaches integrating "[the acoustic transducer] and amplifier on a single chip" ('776 page 4 lines 12-13).

Regarding claim 11, Manabe remains as applied above.

See rejection of claim 5 above.

Regarding claim 12, Manabe and Han remain as applied above.

See rejection of claim 6 above.

8. Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manabe (US Patent 6,678,381 ('381) (already of record)) as applied to claims 1 and 8 above, and further in view of Niehoff et al. (US PGPub 2005/0207590 ('590)).

Regarding claim 7, Manabe remains as applied above.

Manabe further teaches a carrier generation unit (high frequency generator; '381 Fig. 1 #50) for generating a carrier of an ultrasonic band ("ultrasonic generator 50 for generating an ultrasonic signal"; '381 col. 2 lines 60-61); a modulation unit (frequency modulator ('381 Fig. 1 #20) for modulating an output signal of the preprocessing unit to the ultrasonic band signal using the carrier ("frequency modulator 20…frequency modulates the ultrasonic signal with the audio signal to produce the frequency modulated ultrasonic signal; '381 col. 3 lines 2-4); and an ultrasonic amplifying unit (amplifier; '381 Fig. 1 #30) for amplifying an output signal of the modulation unit ('381 Fig. 1).

Manabe does not explicitly teach a preprocessing unit for receiving audio data output from the baseband chip and performing a band compensation and distortion compensation of the received audio data

Addressing the same problem as the inventor, Niehoff teaches a preprocessing unit (frequency characteristic linearization procedure; '590 Fig. 1-2) for receiving audio data output from the baseband chip and performing a band compensation (correction for "transducers with a strongly non-linear frequency characteristic; '590 [0028] lines 4-5) and distortion compensation of the received audio data ("Distortion removal can be effected prior to modulation in the low-frequency range"; '590 [0028] lines 5-6).

Regarding claim 13, Manabe remains as applied above.

See rejection of claim 7 above.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-13 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 8, and 10 of copending Application No. 11/558,489 (US PGPub 2007/0121968) in view of Manabe (US Patent 6,678,381 ('381) (already of record)) as applied to claims 1-2 and 8 above; alternately in view of Manabe in view of Pompei (US Patent 6,775,388 ('388)) as applied to claims 3-4 and 9-10 above; alternately in view of Manabe in view of Han et al. (WO 01/22776 ('776)) as applied to claims 5-6 and 11-12 above; alternately in view of Manabe in view of Niehoff et al. (US PGPub 2005/0207590 ('590)) as applied to claims 7 and 13 above. While the claims of the two applications are not identical, the claims of 11/558,489 are more specific than those of the instant application, rendering the claims of the instant application obvious in view of 11/558,489 in view of the prior art of record.

This is a provisional obviousness-type double patenting rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Loeb et al. (US PGPub 2005/0013455) teaches a MEMS digital-to-acoustic converter with error cancellation.

b. Cheung et al. (US PGPub 2004/0209654) teaches a directional speaker for a portable electronic device.

c. Ladabaum et al. (US Patent 5,982,709) teaches microfabrication of acoustic transducers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE A. ELBIN whose telephone number is (571)270-3710. The examiner can normally be reached on Monday through Friday, 8:00am to 5:00pm EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Suhan Ni can be reached on (571) 272-7505. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. A. E./
Examiner, Art Unit 2615

/Suhan Ni/
Primary Examiner, Art Unit 2614